

REMARKS

This is in response to the Office Action dated October 27, 2009. A one month extension of time is requested and the required fee is filed herein.

The Office Action rejects Claims 1, 4, 5, and 18-21 under 35 U.S.C. 103(a) as unpatentable over Yamada et. al (US 2001/0011497) in view of Simon et. al. (US Patent No. 5,900,390) and Boyton (WO02/01160, US Patent No. 6,789,042). The Office Action rejects Claim 17 under 35 U.S.C. 103(a) as being unpatentable over Yamada in view of Simon and Boyton, as applied to Claim 1, and in further view of Hinckley et al. (US Patent No. 6,844,871).

The applicant respectfully submits that the Office Action has failed to establish prima facie obviousness for at least the reasons presented below.

Boyton Does Not Teach a Random Pattern

According to the Office Action, “Boyston [Boyton] (figures 3a and 3b) discloses a random pattern (99) on a circumferential skirt (20) of an optical encoder (col. 1, lines 65-67)”. Boyton actually teaches a statistically biased pseudo-random sequence encoded in a barcode.

A random pattern, by definition, does not have any encoded data or deliberately placed data, otherwise it would not be random. In contrast, Boyton does not teach a random pattern; Boyton teaches a barcode encoded with a pseudo-random pattern of binary encoded data. The pattern is deliberate and therefore, not random. For example, in Boyton, col. 1, lines 65-67 and column 2, lines 1-3, “*The angle encoder sensor disclosed in this specification is composed of a pseudo-random bar code scale of constant bar pitch and a varying bar width or alternatively, special forms of bar codes with varying bar pitch for coarse absolute positioning.*”, in col. 2, lines 62-67 and col. 3, lines 1-2, “... *the*

*dominant and regressive bits arranged consecutively as a pseudo-random binary code, the pseudo-random binary code sampled as a series of n consecutive bits and also determining the substantially spatially periodic intensity pattern incident on the array, the coded distribution arranged such that any said series of n consecutive bits also comprises over 50% dominant bits and less than 50% regressive bits ...”*and in the Abstract of Boyton, “*A position sensor encodes absolute position via n consecutive members of a pseudorandom sequence of bits, where each bit (30a-30k) comprises a region of high transmission or reflectivity adjacent to a region of low transmission or reflectivity. The pseudorandom sequence is chosen such that every series of n consecutive bits (30a-30k) in the sequence is predominantly formed from a predetermined bit value (1 or 0).*”. This is not a semantic or minor distinction. Pseudo-random coding techniques are well-known information technology and binary data coding methods. In contrast, a random pattern does not contain binary coded information.

Because Boyton does not teach a random pattern, combining Yamada, Simon, with Boyton cannot suggest the currently claimed invention of Claim 1.

Simon Does Not Teach Relative Displacement Required in the Combination

According to the Office Action, with bold text added for emphasis, “*Simon (figure 1) teaches a controller comprising: ... a signal processor (see Col. 3, lines 32-52) responsive to relative movement of said rotatable platter based on information from said pattern; said optical system being positioned to optically acquire surface sequential images from said side circumferential skirt (see Fig. 7) and calculate differences in said sequential surface images thereby determining the direction and **relative displacement of rotation** of said rotatable platter (see Fig. 7).*”

Simon does not teach relative displacement device, but an absolute displacement device. The examiner agreed in the examiner interview summary, “*Mr. Flum argued that the Simon reference is concerned only with absolute position and not that of relative position. The examiner agreed and Mr. Flum stated he will amend the claims accordingly.*” In fact, the flow diagram in Figure 7, of Simon, cited in the Office Action,

demonstrates detection of absolute displacement. For example, in Simon, column 6, lines 21-29, “*Block 122 calculates and stores the precise angle of rotation of code wheel 20, and thus the angle of rotation of the steering wheel, based on the value of the code row and the position of the transition point of the reference mark. As mentioned above, each of the code row values uniquely identifies a section of code wheel 20 covering approximately 5.6 degrees, with the memory of the microprocessor storing the angular displacement of code wheel 20 corresponding to each code row value.*” Descriptions of other blocks of Figure 7 of Simon, for example, in column 5, lines 32-38, for block 112; lines 51-55, for block 114; and lines 63-66 for block 116.

Therefore, Simon cannot be relied on to teach the combination from Claim 1, cited by the Office Action that includes “***relative displacement of rotation of said rotatable platter***”.

Modification of Yamada Changes Yamada’s Principal of Operation

According to MPEP 2143.01 VI, “*If the proposed modification or combination of the prior art would change the principle of operation of the prior art invention being modified, then the teachings of the references are not sufficient to render the claims prima facie obvious.*” MPEP 2143.01 VI goes on to cite case law, re Rati 270 F.2d 810, 123 USPQ 349 (CCPA 1959), “*The court reversed the rejection holding the “suggested combination of references would require a substantial reconstruction and redesign of the elements shown in [the primary reference] as well as a change in the basic principle under which the [primary reference] construction was designed to operate.” 270 F.2d at 813, 123 USPQ at 352.*”

The Yamada reference, see FIG. 2 and paragraph [0041], is a simple optical pulse encoder, attached to an EXOR gate and a D-type flip-flop, see FIG. 3 and paragraph [0042]. The principle of operation of the jog wheel in Yamada is described in paragraphs [0044] and [0047]. According to paragraph [0044] of Yamada, “*The light receiving*

elements 23, 24 receive light beams passing through slits 20a and 21a and the circuit of FIG. 3 produces the signal SR comprising a rotating direction signal Sdr and an angular speed signal Srt as described hereinafter in detail.” and in paragraph [0047], “When the JOG dial 10 is rotated in the clockwise direction (+), the signal Sa generates earlier than the signal Sb. When the JOG dial 10 is rotated in the counterclockwise direction, the signal Sb generates earlier than the signal Sa. Consequently, the rotating direction signal Sdr is "0" in the clockwise direction, and the direction signal Sdr is "1" in the counterclockwise direction. The angular speed dependent on the speed signal Srt is detected by counting the number of the output "1" of the EXOR gate 25.”

Combining Yamada with any other reference to yield the currently claimed invention of Claim 1, would include a “*relative displacement detecting optical system comprising a lens, an image sensor, a light source and a signal processor responsive to relative movement of said rotatable platter based on information derived from said random pattern; said optical system being positioned to optically acquire surface sequential images from said random pattern of said side circumferential skirt and calculate differences in said sequential surface images of said random pattern thereby determining the direction and relative magnitude displacement of rotation of said rotatable platter*”.

Clearly, the principle of operation described in paragraph [0042] and [0047] of Yamada which is a simple quadrature pulse encoder, well known in the art, is different than a system that uses an “... *optical system comprising a lens, an image sensor, a light source and a signal processor responsive to relative movement of said rotatable platter based on information derived from said random pattern ...*”

In addition, the suggested combination of references would require a substantial reconstruction and redesign of the elements shown in Yamada. It would change Yamada from a simple quadrature encoder to something fundamentally different. Referring to Yamada, paragraph [0041], [0043] and FIG. 2, in order to create the presently claimed

invention, Yamada would have to eliminate the rotating circular plate 20 with its plurality of circularly formed slits 20a as well as rotating circular plate 21 with its plurality of circularly formed slits 21a. In addition, light receiving elements 23 and 24 would be eliminated. These would be replaced optical system comprising a lens, an image sensor, a light source and a signal processor responsive to relative movement of said rotatable platter based on information derived from said random pattern.

For at least the reasons cited above, the proposed modification, in accordance with MPEP 2143.01 VI, the proposed modification would change the principle of operation of Yamada, and therefore the teachings of Yamada in combination with the other references are not sufficient to render the claims *prima facie* obvious.

Rebuttal of Motivation to Combine

According to the Office Action, *“It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the controller system of Simon in combination with the controller of Yamada because it provides another design alternative, thus eliminating the number of components required while still maintaining the ability for a user to manipulate the dial.”*

The issue at hand is not whether there is motivation to combine Yamada and Simon but whether there is motivation to combine the references cited to produce the currently claimed invention of Claim 1. The paragraph above, fails to provide such motivation. Further more, even if the stated motivation were hypothetically applied to the currently claimed invention, the Office Action’s statement concerning “eliminating the number of components” as a motivation fails to analyze the complexity of the components. The pulse encoder of Yamada requires light receiving elements (paragraph [0041 of Yamada), simple digital logic (paragraph [0042]) and a processor capable of reading a quadrature output. All of these are simple and inexpensive. The presently claimed invention of Claim 1 requires a lens, image sensor and “a signal processor

responsive to relative movement of said rotatable platter based on information derived from said random pattern”. Both components are more expensive and electronically more complex than the components they replace in Yamada. Using the motivation of the Office Action to “eliminate the number of components” or simplify Yamada, there would actually motivation to not make the presently claimed invention because of the increased component complexly.

The Office Action continues *“It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the random pattern of Yamada as modified by Simon because it will enable the controller to be used in any particular environment, thus making it more adaptable to different devices or functions.”*

The statement by the Office Action that *“It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the random pattern of Yamada ...”* the applicant respectfully asserts probably includes a typographical error. Assuming the Office Action actually meant *“It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the random pattern of Boyton because it will enable the controller to be used in any particular environment, thus making it more adaptable to different devices or functions”*, the applicant asserts that the Office Action has not provided any evidence that the particular combination would *“enable the controller to be used in any particular environment”*.

It is incumbent for the Examiner to provide a motivation, outside of impermissible hindsight from the present application, to support such an assertion.

Conclusion

For at least the reasons set forth above, in this and the preceding pages, the rejection of Claim 1 under 35 U.S.C. 103(a) as unpatentable over Yamada in view of

Simon and Boyton are overcome. Since all of other remaining Claims 2, 4, 5, and 17-21 depend on Claim 1 the rejection of these Claims therefore are also overcome.

For the reasons above, it is respectfully submitted that all of the presently pending claims are in condition for allowance. The Examiner is respectfully requested to withdraw the rejections of the claims, to allow the claims, and to pass this application to issue.

If the Examiner believes that a telephone interview would expedite prosecution of this application, he is invited and urged to telephone the undersigned at (360) 852-8490.

Respectfully Submitted,

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